



White Paper on an Energy Efficiency System For New Brunswick

Department of Energy

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WHITE PAPER ON AN ENERGY EFFICIENCY SYSTEM

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Introduction

To address growing energy demand and environmental concerns the Province will design and implement a new energy efficiency delivery system. It will help New Brunswickers to use energy more efficiently, to control energy expenses and to reduce their impact on the environment. It will provide information and education on energy efficiency and offer incentives to encourage action in homes and businesses.

The Department of Energy has reviewed various energy efficiency delivery systems and has selected a model that the government believes is appropriate for New Brunswick. It addresses the objectives of the Energy Policy, the recommendations of the electricity Market Design Committee and emerging priority issues.

The general concept is described in this paper and responses are invited from the key stakeholders who are most affected. The response sought is to identify any major issues with the basic concept. As detailed designs go forward, input from stakeholders will be solicited on specific design features.

Background

Growing Demand

New Brunswick and the region generally, face growing demand for electricity with the need for new supplies within the next 4-5 years. This became more evident to the public with record peak demand this past winter. NB Power projects the peak to surpass supply by about 120 megawatts by 2007 and 190 MW by 2011.

There are two basic options to meeting new demand, create new supply or reduce the need for supply. In reality both options need to be pursued at the same time. Providing new supply can be accomplished by building new

generating stations or importing energy. Reducing the need for supply can be accomplished through a demand management program, which is the focus of this paper.

Managing Demand

Energy efficiency and demand reduction programs are much lower risk, lower cost, generate more local jobs and benefit the environment by lowering air emissions.

There is a high potential for economic energy efficiency in all sectors as identified in studies completed by the Province and NB Power. Similar work in other jurisdictions confirms these findings. The efficiency measures range from improving lighting and ventilation systems in commercial and institutional buildings to more efficient construction and improved appliances in homes to energy efficient processes in industry.

A particular opportunity for New Brunswick is demand side management (DSM). While energy efficiency and DSM are sometimes used interchangeably, DSM is usually specific to the electricity sector. It involves improving the efficiency of electricity use and reducing peak demand.

DSM tools include financial incentives for consumers to install more efficient equipment and information and education programs directed at specific markets. These tools can be complemented by new electric rate designs to affect consumer behaviour and energy demand. For example, removing the declining block rate structure sends the correct signal to the market and also improves the economics of energy efficiency. Government regulations for buildings and equipment can also be complementary. Once energy efficiency purchasing behaviours become accepted they can be regulated to ensure the gains are not lost.

New Brunswick is unique in Canada where it has a high proportion of electric heating in the residential and commercial sectors which creates a high winter peak load. This abnormal use of electricity offers New Brunswick even more opportunity for reducing our peak electricity requirements which has historically driven the need to build power plants.

Figure 1: In Province Electricity Sales by Customer Class

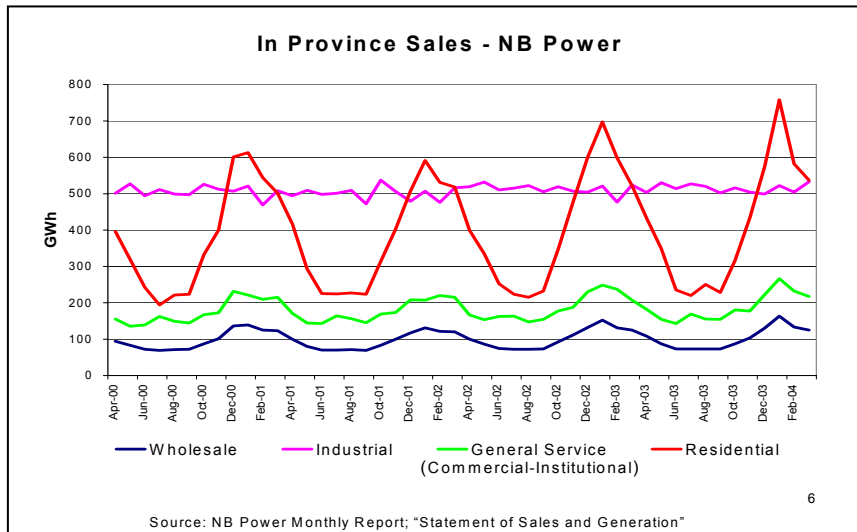


Figure 1 shows the monthly electricity consumption within the customer classes. The one with the largest fluctuations is the residential sector. Over 60% of homes in the province are heated with electricity, most of which is generated with coal or oil. The commercial sector also has a significant winter heat load although smaller than residential. Due to the inefficiencies of converting oil into electricity, electric space heating has more emissions associated with it than oil or gas space heat. Switching electric heating can significantly reduce air emissions and also reduce the peak winter demand for electricity.

The peak demand reduction potential is estimated by NB Power at 270 Megawatts which would be an 8.8% reduction. The total residential electric heat load alone is about 1,100 MW. A significant portion of this could be switched to gas or oil over time.

Benefits of Managing Demand

Energy efficiency and demand reduction programs are alternatives to new energy supply and can have direct benefits for the electrical system carrying lower risk and lower cost than new generation. DSM that cost more than new supply will not be implemented. . Because the cost is lower, the effect over the long term is less pressure on rates and customers will get the energy savings from their individual improvements. The overall risk is lower because it is shared amongst a wide range of individual consumer investments in efficiency projects rather than large central plants. The lower load on the grid also helps to make the system more reliable.

There are other benefits; energy efficiency generates more local jobs because the projects are labour intensive and are spread throughout the province. There is the added benefit to the environment of significantly lowering air emissions.

Policy Direction

The Energy Policy recognizes the benefits of energy efficiency and DSM. The following statements are commitments in the Province's Energy Policy:

“Develop and implement a comprehensive energy efficiency strategy”.

“The Province will seek a variety of broad-based energy efficiency funding mechanisms

“The Province will contribute energy efficiency seed funding to leverage resources from other sources”.

“The Province will work with distribution utilities to develop a fuel switching strategy as part of the energy efficiency strategy.”

“The Province will examine the role of a collaborative demand side management program”.

Also, recommendation 8-80 of the electricity Market Design Committee (MDC) Report states that:

*“The energy efficiency programs should have dedicated program funding;
and*

Energy efficiency programs need a central facilitator separate from energy suppliers.”

Objectives of the Energy Efficiency System

To respect the policy commitments government has made in the energy policy and the Market Design Committee recommendations and to address the future needs in electricity supply, the Province has the following objectives for its energy efficiency system:

- Improve the efficiency of energy use in all sectors;
- Significantly reduce peak electricity demand; delay need for new supply;
- Develop a long term, adequately funded energy efficiency infrastructure;
- Deliver a broad range of energy efficiency services;
- Maximize collaboration or partnership opportunities;
- Reduce costs to consumers;
- Reduce upward pressure on rates over time;
- Report to the PUB and government on performance; and
- Reduce environmental impacts particularly greenhouse gas emissions.

To meet these objectives the Province examined a range of delivery options.

Delivery Options

Energy efficiency or DSM programs are typically delivered by governments or energy utilities, both gas and electric.

In recent years, more collaborative methods have been adopted by governments and utilities to deliver the incentives and promotional programs. They set up partnerships with communities, product manufacturers and retailers, industry associations and other non-government organizations. Such collaborative efforts are more cost effective and fit better into the market because the market players are involved.

Governments are also beginning to set up independent energy efficiency agencies with greater flexibility to collaborate with the wide range of market players. With federal assistance, the Yukon set up a crown corporation called the Energy Solutions Center and has seen considerable success in delivering energy efficiency programs and developing renewable energy projects.

A model that has been particularly successful is in the State of Vermont where the agency is referred to as an “energy efficiency utility”. The agency is funded by the electricity distribution utilities and its operation is regulated by the public utilities board to ensure the benefits of the funding flows directly back to the customer. A similar arrangement exists in Oregon and the provinces of Ontario and Manitoba are in the process of setting up energy efficiency agencies that are independent of government and of the utilities.

The Province has examined these models and has determined that a model similar to that in Vermont would work well in New Brunswick. Key features of that model are:

- The DSM programs are delivered by a single agency called Efficiency Vermont.

- Efficiency Vermont is separate from the distribution utility and is referred to as an “efficiency utility”.
- They are required to deliver DSM activities that are the least cost resource or cheaper than new electricity supply.
- Efficiency Vermont has a performance contract with the Vermont Public Service Board that was awarded through a Request for Proposal process.
- They have been operating for four years and employ 100 people.
- They have been achieving energy savings equal to 1% of the annual sales. A one percent reduction per year is close to the projected demand growth in New Brunswick. Within ten years it represents a 10% savings, which is very significant.

We should be able to achieve similar results in New Brunswick and perhaps even better because of our high winter peak demand.

A New Brunswick Delivery System

The Concept

Department of Energy examined options for a concerted effort in energy efficiency and demand reduction and has concluded that an agency, separate from electricity distribution utilities, is the most effective means of program delivery. This is consistent with the Energy Policy and the recommendations of the Market Design Committee.

Such an agency would be essentially funded by the distribution utilities. It will have the flexibility to borrow funds, loan funds, receive and make contributions, sub-contract services, etc. This flexibility is needed to deliver innovative

programs in collaboration with a wide range of agencies and leverage federal and other funding sources.

An efficiency agency in New Brunswick would deliver a range of education, promotion and incentive programs. Its mandate would be to achieve a transformation of the New Brunswick market to more efficient energy using products in areas such as lighting and heating and more efficient practices in building construction and operations and in industrial processing. The cost of achieving the savings will be lower than if new energy supplies from power plants are provided.

The establishment of an independent efficiency agency will address many of the commitments made by the Province in its Energy Policy. It is keeping in line with the recommendations of the electricity Market Design Committee and the efficiency objectives the province has set.

The efficiency program delivery model selected addresses the broad based funding mechanism commitment in the Policy. Using funds provided by the distribution utilities will provide long-term budget stability rather than fluctuating support from government program budgets. A portion of the investments that might have gone to new energy supply will go to DSM. The province will contribute seed funding in the form of development costs associated with setting up the agency, will seek funding from the federal government, and will develop complementary regulations.

It is compatible with the fuel switching strategy and is a collaborative demand side management approach. This model will provide the flexibility to enter into a wide range of collaborative arrangements with organizations and communities with compatible interests and will provide the ability to leverage funding from the federal government and corporations.

The Market Design Committee recognized that having utilities deliver energy efficiency and demand management programs while at the same time trying to

sell electricity for profits were incompatible efforts. Their recommendation for efficiency program delivery be by a “central facilitator, separate from energy suppliers”, recognizes this motivational anomaly. This is being confirmed as other jurisdictions adopt the concept, such as Oregon, Vermont, Ontario, Manitoba and the Yukon. Funding provided by the distribution utilities addresses the recommendation for “dedicated funding” for programs.

Clear Authority and Mandate

Some of the fundamental requirements for an agency to successfully achieve the Province’s objectives for the energy efficiency system are to have authority with clear and consistent direction and adequate funding. A recent study by a group of regulatory experts examined the policy options and approaches of electric utility energy efficiency programs in 14 US States and 4 countries. The conclusion was that “clear and consistent commitment of policy makers” is a key to successful programs whether delivered by electric utilities or by an independent agency.

Other important factors noted in the study include responsiveness to regulatory (Public Utilities Board) direction, staff competency, performance incentives, sustainability of the institution and its budget sources and links to electricity system planning.

In New Brunswick’s newly restructured electricity industry, the authority and clear mandate of the energy efficiency agency will be required under the Electricity Act. Other requirements including regulatory oversight by the Public Utilities Board, funding contributions by the distribution utilities and other operational rules will also require provisions under the Electricity Act.

Funding

As mentioned earlier, the energy efficiency agency will be funded by distribution utilities. It will be a performance based operation with funding related to the energy savings achieved. This will also allow the distribution utilities to rely on the performance of the agency in achieving the savings and to do their forward planning.

Compared to new supply, DSM has no net cost but is a saving to the distribution utility. By regulation the efficiency agency will have to operate at a lower cost than new electricity supply. The savings are then passed on to customers through rates.

The budget and spending will be reviewed by the PUB in the context of life-cycle savings achieved by customers and utilities. With the funding embedded in the electricity industry it will facilitate clear and consistent regulatory oversight by the PUB to ensure that ratepayer's money provided through the distribution utilities is used effectively for the benefits of ratepayers.

The funding formula is expected to be also based proportionately on distribution utility sales (per kilowatt-hour) as it is in other jurisdictions where the model is used. This achieves a level of equitable treatment of customers and distribution utilities.

The efficiency agency will be mandated to maximize collaboration with partners to inject outside funds, such as from the Federal government, where program objectives are complementary. Many of the measures to be implemented are eligible for cost sharing with the federal government by as much as 50%, further reducing the risk and improving the benefits to the distribution utilities and their customers.

The expenditures depend upon the amount of DSM implemented. The total DSM potentially available is quite large and is typically higher than can actually be achieved.

It will take a couple of years for the efficiency agency to design and commence delivery of its programs. In the start-up period the agency should operate on a budget that reflects what it can realistically achieve, which will be lower than full operation.

Performance Assessment

Energy savings and demand reduction targets will be developed through market analysis and applied to performance requirements of the efficiency agency either through contract or corporate direction. Determination of the targets will involve such factors as the avoided cost of the distribution utilities, the efficiency measure opportunities and priorities and the capacity of the efficiency agency to deliver the programs.

The performance of the efficiency agency will be defended before the PUB to ensure that ratepayer's funding is appropriately used.

Next Steps

- ❖ The Province will consult directly with key stakeholders to receive feedback on this general concept.
- ❖ A more detailed organizational and regulatory framework will be prepared along with detailed component design papers.
- ❖ Legislative and regulatory proposals will be brought to government with the intent to commence implementation in 2005.